FIGURES

| Schematic View of the Sonic Head | 8 |
|---|----|
| Typical Cobble-Sized Rock Fragments | 10 |
| Sonic Vibration Increases Penetration into Subsurface | 12 |
| Reduction in Tip and Sleeve Stress and Total Push Force to Advance Sensors | 13 |
| Sonic Cone Penetrometer Test Drive System and Controls | |
| Site Characterization and Analysis Penetrometer System Truck | |
| Raman Spectroscopic Equipment in the Cone Penetrometer Truck | |
| Raman and Fluorescence Spectra | 19 |
| Regional Three-Dimensional Contaminant Transport Study in Russia | 24 |
| Russian Driller and American Researcher Installing Strata Sampler TM | 25 |
| Environmental Measurement While Drilling Technology Demonstration | 29 |
| Tracking the Depth of Slant Hole Under Mock Tank Leak Demonstration | |
| Cesium-137 Measurements Made During Drilling | 30 |
| Aerial View of the Alternative Landfill Cover Demonstration Site | 32 |
| Acquisition of Laser-Induced Fluorescence Spectra of Indicator Plants | 37 |
| FLUTe [™] Membrane Indicating DNAPLs from a Cone Penetrometer Hole | 42 |
| Cone Penetrometer Data Plots of Subsurface DNAPL Contamination | 43 |
| Data Plots Indicating Subsurface Perchloroethylene and Trichloroethylene | 44 |
| Cone Permeameter [™] Hydraulic Conductivity Profiles | 47 |
| Hydraulic Conductivity Profiles at Launch Complex at the Cape Canaveral | 47 |
| Cone Permeameter™ Taking Multiple Pressure Measurements | 48 |
| Portable Data System Calculates the Inferred Permeability in Real Time | 49 |
| Subsurface Barrier Validation Using SEAtrace TM Monitoring System | 53 |
| Self-Powered Mobil SEAtrace [™] Monitoring System | 55 |
| Portable Radioactive Contaminant Sampling System | |
| Exploded View of Rapid Liquid Sampler Components | 58 |
| Fluidic Sampling System for At-Tank Analysis | 63 |
| Deployment Platform for the Combined Raman/Electrochemical Noise Sensor | 67 |
| Conceptual Design of Automated High-Level Waste Tank Monitoring System | 71 |
| Slurry Monitoring Test System Photographs | 73 |
| Slurry Monitoring Test System Diagram | 76 |
| High-Resolution Spectrometer for Continuously Monitoring Incinerator Emissions | 79 |
| System Architecture Capable of Integrating Third-Party Analytical Components | 83 |
| Illustration of Portable Real-Time Uranium Survey Tool | |
| Spectrum Obtained During Inspection of Insulated Drain Lines | 90 |
| X-Ray, K-Edge Technology Demonstration | |
| X-Ray, K-Edge Inspection Head Being Positioned | 93 |
| Monitoring Thermal Emission Spectra of Elements in a Molten Glass Stream | 96 |